

METHOD OF DOPING IMPURITY TO SEMICONDUCTOR

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Patent Number: JP2017634
Publication date: 1990-01-22
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Requested Patent: ☐ JP2017634
Application Number: JP19880168208 19880706
Priority Number(s):
IPC Classification: H01L21/225
EC Classification:
EC Classification:
Equivalents:

Abstract

PURPOSE: To make it possible to obtain an impurity added layer which is extremely thin of 500Angstrom or less with excellent control by having an LB film deposition process, an organic substance removal process, and an impurity diffusion process.

CONSTITUTION: In the first process, a desired number of LB films containing Cd atom 40 which serves as a dopant are deposited on the surface of a GaAs substrate 7 by a Langmuir-Blodgett's technique. After passing through the second process in which the three molecular layers on the substrate 7 thus obtained are processed in O₂ plasma, hydrogen carbonate chains of hydrophobic group are removed. Thus, an atomic layer 8 composed of Cd atom 40 can be formed on the substrate 7. In the third process, after forming a protective layer 9 made of SiO₂, an insulation film such as SiO₂ or SiN, etc., or a high-melting point metal layer such as WSi on the atomic layer 8, it is annealed in high temperatures and a p-type layer 10 of Cd diffusion is formed. Since the p-type layer 10 thus obtained is formed from impurity atoms of several atom layers, an extremely thin film of 500Angstrom or thinner can be formed.